

# **FACT SHEET FOR STATE WASTE DISCHARGE PERMIT ST-8028**

## **City of Ritzville Wastewater Treatment Facility**

### **SUMMARY**

The City of Ritzville is a small rural community located about 60 miles west of Spokane along Interstate 90.

In 2000 the city completed construction of a new wastewater treatment facility utilizing facultative wastewater stabilization lagoons, storage ponds, chlorine disinfection with land treatment to complete the wastewater treatment process with spray irrigation. Unfortunately, the system is not functioning as intended. The lagoon dikes are failing and the land application soils have accumulated excess sodium. The city is currently investigating options and has shifted operations and final wastewater treatment to a new irrigation circle. The revised permit conditions will include a compliance schedule addressing the revisions to the facility and its operations plus provisions to identify and control sources of TDS in the collection system.

The permit will be reissued for a period of five years.

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### **INTRODUCTION**

This fact sheet is a companion document to the proposed State Waste Discharge Permit No. ST-8028. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastewater to waters of the State of Washington. This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the State include procedures for issuing permits (Chapter 173-216 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by the Eastern Regional Office of the Washington State Department of Health and by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D--Response to Comments

| <b>GENERAL INFORMATION</b>            |   |
|---------------------------------------|---|
| Applicant                             | City of Ritzville   |
| Facility Name and Address             | City of Ritzville - Wastewater Treatment Facility west of the City at end of N. Adams St.   |
| Type of Treatment System:             | Facultative lagoon, storage lagoon and land treatment via spray irrigation  |
| Discharge Location                    | Latitude: 47° 07' 49" N Longitude: 118° 23' 51" W.  |
| Legal Description of Application Area | N 1/2 of Section 22, township 19N, range 35 E.W.M.<br>Latitude: 47° 07' 49" N.<br>Longitude: 118° 23' 51" W.  |
| Contact at Facility                   | Name: Michael Pearson<br>Telephone #: (509)659-1497   |
| Responsible Official                  | Name: Larry Swift<br>Title: Public Works Director<br>Address: City of Ritzville 209 N. Adams St.<br>Telephone #: (509)659-1920<br>FAX # (509)659-0253 |

## **BACKGROUND INFORMATION**

### *DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM*

#### **HISTORY**

The City of Ritzville is currently investigating problems with the construction and operation of its new wastewater treatment facility.

The 2000 wastewater treatment facility replacement utilizes facultative wastewater stabilization lagoons, storage ponds, chlorine disinfection with land treatment to complete the wastewater treatment process via spray irrigation.

The new lagoons are man-made impoundments located in the flood plain of Paha Coulee. Paha Coulee is an intermittently flowing stream that carries seasonal runoff immediately south of the lagoons. As part of this construction Paha Coulee has been slightly rerouted to use the old lagoons/infiltration basins as wetland mitigation and to minimize the disruption of the stream channel.

The City has obtained funding from the Department to investigate the partial failure of the existing wastewater treatment facility. The failure is significant in two of the four lagoons. Bubbles have formed due to methane gas in all four lagoons. The source of the methane gas is not definitively identified, though possibilities have been identified to guide the investigation. The lagoon dikes are failing in cell 3 and signs of pending dike failure are indicated in all the other dikes. The reasons for the dike failures again is not known though possibilities have been preliminarily considered in order to guide further investigations. Public health and safety are threatened by the failures. The scope and cause of the failures will be investigated and remedies recommended.

Additionally the annual sampling for crop management plan noted a build up of sodium in the irrigation circle. The irrigation has been moved to the alternate irrigation circle and gypsum added to the soil.

#### **COLLECTION SYSTEM STATUS**

The collection system was evaluated as part of the facility planning process. The wastewater facilities plan concluded that the collection system was subject to infiltration and inflow (I/I). The discharge monitoring data indicates that during the current drought infiltration and inflow has been minor and I/I is probably not contributing to the TDS in the plant influent.

The city in the past has indicated a desire to set up a program to systematically make rehabilitation of the collection system a long term commitment and attack a part of the problem each year.

During the permit of the last permit the City repair or replaced sewer line in the following locations:

in the alley between 5th and 6th and Division and Washington,  
in the alley between 9th and 10th and between Columbia and Palouse,  
in the alley between Main and Railroad Avenue and between Jefferson and Jackson,

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in the alley between Birch and Cherry and between Division and Columbia,  
on 1st between Chelan and Columbia,  
in the alley between 1st and Railroad and between Division and Columbia.  
On Low between Olive and Pear.

The city is also faced with the likelihood of growth south of town near the expressway. This also provides an opportunity to reconfigure the collection system to remove or bypass new developments around an old undersized pump station in the old business district.

#### TREATMENT PROCESSES

The new wastewater treatment facility utilizes facultative wastewater stabilization lagoons, storage ponds, chlorine disinfection with land treatment to complete the wastewater treatment process via spray irrigation. In total, four (4) lagoons are utilized. The surface acreage at high water is: cell 1 - 10.40 acres, cell 2 - 13.40 acres, cell 3 - 14.56 acres, and cell 4 - 10.40 acres. The total volume is 68.56 MG. Supplemental irrigation was not recommended in the engineering report for those years with rainfall below the mean. No supplemental irrigation water is currently available.

#### DISTRIBUTION SYSTEM (SPRAYFIELD)

The sprayfield is comprised of two semi-circular center pivot set ups. Each center pivot section covers 66 acres. The irrigation is set for one 66 acre field at one time. To use the second field in a rotation requires the physical move of the center pivot and irrigation arm to the second center pivot feed. The facility plan and the crop management plan in it used a projected 58 acres for normal flows and rainfalls and projected a need for 66 acres allowing for the rainfalls to exceed the mean on a 10 (ten) year recurrence interval.

The 2005 Irrigation and Crop Management Plan noted that “wastewater sodium is having an undesired effect on sprayfield soil chemistry.” The irrigation was moved to the second center pivot feed, consideration was also given to other crops more tolerate of sodium and the addition of gypsum to mitigate sodium’s impact on soil chemistry.

#### RESIDUAL SOLIDS

This treatment facility has no headworks (grit and screenings) nor primary and secondary clarifiers. Accumulated biosolids will need to be removed every few years from the lagoon cells, primarily cell No. 1.

#### GROUND WATER

The crop management plan anticipates application of the wastewater at agronomic rates and is designed to have no impact on the groundwater. Groundwater may occur at a depth of four (4) feet depending on the location. During construction of the pipelines to the irrigation center pivots, groundwater was not noted. Highly fractured basalt and/or caliche were observed at depths less than four feet and was variable.

During construction of the groundwater monitoring wells, the monitoring well locations were changed. One well is located about 200 feet downstream of the site that does penetrate groundwater. One well is located upstream of the site at the old treatment plant site. It was

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originally thought to locate a groundwater well upgradient and north of the irrigated site and one well downgradient and immediately south of the middle of the irrigated site. A proposed well was dry at 70 feet total depth and was therefore abandoned. A second well to the east was dry at 37 feet in competent basalt and was also abandoned. A shallow well in the middle of the south limit of the irrigated site was placed to intercept shallow groundwater flow at the surface of the basalt layer as determined by the well drilling logs.

For the purposes of the permit's monitoring schedule the previously existing groundwater monitoring will continue to be designated as MW-1, MW-2, MW-3 and MW-4. The three added wells will be designated from east to west as MW-5, MW-6 and MW-7. Background groundwater quality is intended to be monitored by monitoring well MW-5.

**PERMIT STATUS**

The permit for the current facility was issued on January 29, 2001 with an effective date of March 1, 2001. The expiration date is February 28, 2006.

**SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT**

The facility last received an inspection for compliance on September 9, 2003. Several technical assistance site visits have occurred since then. The discharge monitoring reports indicate the facility is not achieving the anticipated level of treatment for BOD and TSS. The influent concentration of TDS is much higher than anticipated as is the effluent concentration and the ground water concentrations of TDS are well above the allowable in the ground water quality standards.

**WASTEWATER CHARACTERIZATION**

The concentration of pollutants in the discharge are as reported in the discharge monitoring reports. The wastewater discharge prior to land application is characterized for the following parameters based on the discharge monitoring reports for 2004 and 2005:

**Table 1: Wastewater Effluent Characterization**

| <u>Parameter</u>      | <u>Concentration</u> |
|-----------------------|----------------------|
| BOD5, monthly average | 48 mg/L              |
| TSS, monthly average  | 108 mg/L             |
| TDS, monthly average  | 850 mg/L             |
| Fecal Coliform        | < 10 col/100 mL      |

**SEPA COMPLIANCE**

SEPA and NEPA requirements were complied with during the preparation of engineering documents for construction of the new wastewater facility. The SEPA checklist and DNS was dated September 24, 1997 by the city.

**PROPOSED PERMIT LIMITATIONS**

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the State. The minimum

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requirements to demonstrate compliance with the AKART standard are derived from the *Water Reclamation and Reuse Standards*, the *Design Criteria for Municipal Wastewater Land Treatment*, and Chapter 173-221 WAC.

The permit also includes limitations on the quantity and quality of the wastewater applied to the sprayfield that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Quality Standards (Chapter 173-200 WAC).

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

***TECHNOLOGY-BASED EFFLUENT LIMITATIONS***

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). The following conditions are necessary to satisfy the requirement for AKART for a land treatment system:

1. Project was designed in accord with the design guideline jointly prepared by the Department of Health and Department of Ecology, "Design Criteria for Municipal Wastewater Land Treatment Systems for Public Health Protection."
2. Wastewater shall be applied via spray irrigation at or below agronomic rates for total nitrogen and water, and at rates for other wastewater constituents that are protective of the background ground water quality.
3. Total nitrogen and water shall be applied to the sprayfields in accordance with the current Irrigation and Crop Plan.
4. The treatment system must be operated so as to protect the existing and future beneficial uses of the ground water and not cause a violation of the ground water standards.

***GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS***

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

Applicable ground water criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge include the following:

**Table 2: Ground Water Quality Criteria**

|                              |                 |
|------------------------------|-----------------|
| Total Coliform Bacteria      | 1 Colony/100 mL |
| Total Dissolved Solids (TDS) | 500 mg/L        |
| Chloride                     | 250 mg/L        |



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|            |                            |
|------------|----------------------------|
| Sulfate    | 250 mg/L                   |
| Nitrate    | 10 mg/L                    |
| pH         | 6.5 to 8.5 standard units  |
| Manganese  | 0.05 mg/L                  |
| Total Iron | 0.3 mg/L                   |
| Toxics     | No toxics in toxic amounts |

The Department has reviewed existing records relative to the criteria given in Chapter 173-200 WAC. Nitrates and coliforms have been monitored since 1993. Nitrates are below the standard and coliforms are usually below the standard. The WWTP influent TDS concentrations exceed the ground water standards and after concentration further by evaporation the TDS concentrations exceed the ground water standards by a significant margin. The Department will use the criteria expressed in the regulations in the proposed permit. The discharges authorized by this proposed permit are not expected to interfere with beneficial uses, though TDS is a possibility. Therefore, ongoing monitoring is indicated and source control appears necessary.

The wastewater facilities plan did a statistical determination of background water quality for nitrates, ammonia and chloride. Monitoring well MW-1 is the background water quality well and the results were:

| MW-1 Parameter           | Nitrates, mg/L<br>as N | Ammonia,<br>mg/L as N | Chloride<br>ln (mg/L Cl) |
|--------------------------|------------------------|-----------------------|--------------------------|
| background water quality | 5.3                    | 0.25                  | 155                      |

The Permittee is required in section S 2.B. of the proposed permit to collect background groundwater contaminate concentrations near the point of discharge.

### **MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

#### ***INFLUENT AND EFFLUENT MONITORING***

The monitoring and testing schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, source identification and control of specific pollutants (i.e. TDS) and cost of monitoring.

#### ***VADOSE ZONE MONITORING***

The depth of soil is estimated in the engineering report to be four (4) feet. Ground water monitoring is anticipated to be shallow. A need for Vadose Zone Monitoring is not anticipated.

#### ***GROUND WATER MONITORING***

The monitoring of ground water at the site is required in accordance with the Ground Water Quality Standards, Chapter 173-200 WAC. The Department has determined that this discharge

has a potential to pollute the ground water. Therefore the Permittee is required to evaluate the impacts on ground water quality. Monitoring of the ground water at the site boundaries and within the site is an integral component of such an evaluation.

## **OTHER PERMIT CONDITIONS**

### *REPORTING AND RECORDKEEPING*

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-216-110).

### *FACILITY LOADING*

The design criteria for this treatment facility are taken from January 1998 Wastewater Facility Plan (Table 1-3 of TM-1) prepared by E&H Engineering, Inc. and are as follows:

|                                      |             |
|--------------------------------------|-------------|
| Average Annual Design Flow:          | 0.27 mgd    |
| Maximum Month average flow:          | 0.35 mgd    |
| Maximum Day Flow:                    | 0.55 mgd    |
| Annual Average BOD influent loading: | 500 lbs/day |
| Maximum Month BOD influent loading:  | 600 lbs/day |
| Annual Average TSS influent loading: | 500 lbs/day |
| Maximum Month TSS influent loading:  | 600 lbs/day |
| Annual Average TN influent loading:  | 110 lbs/day |
| Maximum Month TN influent loading:   | 130 lbs/day |

The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). The Permittee is required to submit an engineering report when the plant reaches 85% of its flow or loading capacity. For significant new discharges, the permit requires a new application and an engineering report (WAC 173-216-110[5]).

### *CROP MONITORING*

Crop consumption of macro- and micro-nutrients is a required element of the IRRIGATION AND CROP MANAGEMENT PLAN. The documentation of crop consumption shall be in the IRRIGATION AND CROP MANAGEMENT PLAN submitted for the coming land application season.

### *SOIL MONITORING PROGRAM*

The facility plan recommended that the soil monitoring program sample to a depth of one foot and that analysis should include soil nutrients and pH on the assumption that the soil would be lightly loaded. Generally the Department anticipates sampling through the root zone. The soil assessment in the facility plan estimated the soil depth at four (4) feet. A greater depth of soil sampling may be justified if the assumption of light nutrient loading from either wastewater or supplements is incorrect. The depth of soil sampling and degree of loading are to be discussed in the irrigation and crop management plan.

#### ***IRRIGATION AND CROP MANAGEMENT PLANS***

The irrigation and crop management plan is required to implement the engineering report(s) and operations and maintenance manual. This plan shall include a consideration of wastewater application at agronomic rates and should describe and evaluate various irrigation controls.

#### ***OPERATIONS AND MAINTENANCE***

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

#### ***RESIDUAL SOLIDS HANDLING***

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503 and the Department of Ecology under Chapter 173-308 WAC *Biosolids Management*.

#### ***PRETREATMENT***

WAC 173-216-110 requires that the list of prohibitions in WAC 173-216-060 be included in the permit.

Federal pretreatment requirements in 40 CFR 403 and Sections 307(b) and 308 of the Clean Water Act apply to this facility. Therefore notification to the Department is required when pretreatment prohibitions are violated and when new sources of commercial or industrial wastewater discharge are added to its system.

The influent total dissolved solids (TDS) in the influent is excessive suggesting sources exist that need control. The permit will require routine monitoring of TDS concentrations in the influent at the influent lift station and work upstream in the collection system to identify sources. The permit will require development and implementation of a collection system monitoring plan for source identification and control of TDS.

#### ***SPILL PLAN***

The Department has determined that the Permittee does not store a quantity of chlorine that has the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

#### ***COMPLIANCE SCHEDULE***

The permittee has begun an investigation into the cause of the wastewater treatment plants structural failure and impact on impaired treatment performance. The funding agreement for the investigation and wastewater facilities plan update anticipates that the investigation and planning phase will be complete by May 30, 2007. If application for funding is made to the PWTF in the early summer of 2007 the design can likely be done the following spring of 2008. If construction can be successfully funded through USDA-RD, construction could possibly start spring of 2008.

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If construction funding is through Ecology the application would be submitted in October 2008 with funds becoming available July 2009 and construction beginning in 2010.

The amount of funds needed from USDA or Ecology will be impacted by whatever legal settlements are reached by Ritzville. While, Ecology desires that repairs be made expeditiously and prudently, Ecology is not able to predict the outcome of any lawsuits nor the findings of the investigation. Therefore, the compliance schedule in the permit will only address the completion of the wastewater facilities plan update. The follow up implementation will be determined based on the facts known at that time and the appropriate compliance schedule for implementing the recommendations made.

***GENERAL CONDITIONS***

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department. Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to submit written notice of significant increases in the amount or nature of discharges (typically new industrial discharges) into the sewer system tributary to the permitted facility. Condition G6 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G7 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Condition G8 requires application for permit renewal 60 days prior to the expiration of the permit. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

### **RECOMMENDATION FOR PERMIT ISSUANCE**

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the State of Washington. The Department proposes that the permit be issued for five (5) years.

### **REFERENCES FOR TEXT AND APPENDICES**

Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. Field Techniques for Measuring Wetland Soil Parameters, Soil Science Society of America Journal, Vol. 53, No.3.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology and Department of Health, 1997. Water Reclamation and Reuse Standards, Ecology Publication # 97-23. 73 pp.

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology Publication # 96-02.

Washington State University, November, 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

Washington State Department of Ecology Home Page

<http://www.wa.gov/ecology/>

Laws and Rules web site

<http://www.wa.gov/ecology/leg/laws-etc.html>

## **APPENDICES**

### ***APPENDIX A--PUBLIC INVOLVEMENT INFORMATION***

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 18 and August 25, 2005 in the Adams County Journal to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on January 19, 2006 in the Adams County Journal to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Department of Ecology,  
Eastern Regional Office,  
4601 North Monroe  
Spokane, Washington 99205-1295.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (509)329-3519, or by writing to the address listed above.

This permit was written by Richard A. Koch, P.E.

**APPENDIX B--GLOSSARY**

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation**--The average of the measured values obtained over a calendar month's time.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of the collection or treatment facility.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing



the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Distribution Uniformity**--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

**Engineering Report**--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).



**Soil Scientist**--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Coliform Bacteria**--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

**Total Dissolved Solids**--That portion of total solids in water or wastewater that passes through a specific filter.

**Total Suspended Solids (TSS)**--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**Water Quality-based Effluent Limit**--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

*APPENDIX C--TECHNICAL CALCULATIONS*

*APPENDIX D--RESPONSE TO COMMENTS*